

What is claimed is:

1. A compound motor comprising a plurality of motors, each motor comprising:

5       a stator having a stator winding; and  
      a rotating member that is rotatably supported on said stator;  
      wherein all rotating members of said motors share same axis  
of rotation, and the stator winding of each motor has a different  
number of poles.

10

2. A compound motor as recited in claim 1, wherein the plurality of motors are disposed along the rotational axis in order of number of poles from lowest to highest, and the stator winding of each motor is connected in parallel to a common power circuit.

15

3. A compound motor as recited in claim 1, wherein each rotating member is rotatably supported by bearings and can rotate independently of one another.

20

4. A vacuum pump having an inlet and an exhaust and comprising a plurality of motors, each motor comprising:

      a stator having a stator winding;  
      a rotating member that is rotatably supported by bearings  
on said stator, and can rotate independently of one another; and  
25       blades disposed on said rotating member for evacuation;  
      wherein all rotating members of said motors share same axis  
of rotation, and the stator winding of each motor has a different  
number of poles.

5. A vacuum pump as recited in claim 4, wherein all rotating members of said motors rotate independently of one another.

5        6. A vacuum pump as recited in claim 4, wherein; the stator winding of each motor is connected to a common power circuit.

7. A vacuum pump as recited in claim 4, wherein the plurality of motors is arranged from the inlet to the exhaust in order of  
10       number of poles from lowest to highest.

8. A vacuum pump as recited in claim 4, wherein said vacuum pump is a turbo-molecular pump.

15       9. A method for operating a compound motor comprising:  
          arranging a plurality of motors with differing numbers of stator winding poles such that the motors share the same axis of rotation;

          connecting the stator windings of each motor in parallel to  
20       a single power circuit capable of supplying an exciting current to the stator windings; and

          operating the plurality of motors at speed ratios fixed by differing rotational speeds of each motor by supplying an exciting current of a prescribed frequency to each motor simultaneously.